

Early and mid career researcher forum

A FORUM OF THE AUSTRALIAN ACADEMY OF SCIENCE

RESPONSE TO NATIONAL CAREER DEVELOPMENT STRATEGY GREEN PAPER

The Australian Early-Mid Career Researcher Forum is the national voice of Australia's future scientific leaders. The Forum engages with early- and mid-career researchers from around Australia and advises the Australian Academy of Science on the key issues raised by younger researchers, to help inform its policy recommendations to government. The Forum examines critical issues including career structure, education, job security, funding, training and gender equity across the science, technology, engineering and mathematics (STEM) disciplines. The Forum provides a vital connection between Australia's most eminent scientists and tomorrow's scientific leaders.

Operating under the auspices of the Academy, the Forum liaises with national organisations such as the Commonwealth Scientific and Industrial Research Organisation (CSIRO), Defence Science and Technology Organisation and Science & Technology Australia, to make positive contributions to the future careers of emerging scientists in Australia.

1. The Early-Mid Career Researcher Forum of the Australian Academy of Science has identified a critical gap between the training received by most PhD students and early-mid career researchers in the science, technology, engineering and mathematics disciplines. The typical PhD offers an excellent but narrow set of discipline-specific skills. The training required today is broad, not just discipline-focused, with an urgent need to prepare students for career changes over time, and should include transferable professional skills such as business, communication, management and finance.

2. One role for a National Career Development leadership body could be to ensure that every PhD student and early-mid career researcher receives training and mentoring in a broad set of skills, to ensure that universities make use of a wide range of supervisors and lecturers (including those from industry, research institutes and the CSIRO), and to ensure that workplaces implement family-friendly policies that are supportive of career-life balance for early-mid career researchers.

The National Career Development Strategy is an important initiative that could help to coordinate career development assistance, so that people are able to gain the knowledge and skills needed to manage key junctures in their careers. To fully realise the goals of the strategy, the Forum encourages the Government to give further consideration to establishing effective career development and professional support for early and mid-career researchers to ensure they acquire the knowledge and skills needed to navigate the specific challenges they will face in their careers.

1. Do you have any comments on what you see as the key priorities and proposed direction for the National Career Development Strategy?

Workforce projections indicate that demand for research qualified people is set to grow at a faster rate than overall employment demand in our economy over the decade to 2020, with the number

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of employed individuals with a doctorate by research qualification (PhD) expected to rise by 3.2% per annum over this period.¹

Australia currently graduates over 6,000 PhD students each year, with most of these in the STEM disciplines². In 2010, 39.6% of these graduates were from overseas. However we are currently graduating more PhD students than there are long-term academic research positions available. To gain the best return on the education investment it is important that these highly skilled graduates are able to find career pathways that make best use of their skills. These career pathways need to include alternatives to the traditional academic model and include other alternative rewarding careers where skills are fully utilised.

To do this it is important that we provide quality research training and ongoing career development for our best thinkers and researchers. The majority of PhD programs equip researchers with skills specific to their field of research and for thesis writing. Few programs equip people with the skills that they need to become independent research leaders, or provide other essential professional skills such as personnel and business management, commercialisation, effective communication and teaching skills. These transferable skills would help those wishing to continue working within a research career, and for those that might wish to transition to other careers.

Both Governments and individuals invest significant time and money in equipping our 'best and brightest' with qualifications and skills. We need to ensure that we maximise this investment by providing assistance at key critical career junctures, such as:

- (i) Secondary school to higher education;
- (ii) Higher Education to employment;
- (iii) Postgraduate/Research Higher Degree to employment;
- (iv) Career disruptions – such as health-related breaks and parental/carer's leave;
- (v) Between different employers for those working on non-continuing contracts.

To help individuals make decisions about their career development and training it is important that reliable evidence and sound advice is available to them to help them ascertain where potentially successful career opportunities lie, and find out about the skills that they might need to develop.

One such source of evidence is the *Beyond Graduation Survey* (BGS) from Graduate Careers Australia, which investigates the activities, outcomes and experiences of graduates from Australian higher education institutions several years after the completion of their studies³. The BGS is the first large-scale longitudinal study of higher education graduates in Australia and currently resurveys respondents to the *Australian Graduate Survey* three years after course completion. This

¹ Research Skills for an Innovative Future, Research Workforce Strategy, Department of Innovation, Industry, Science and Research 2011

² Larkins, F.P. Higher Degree Research Student Profile 2000-2010, Australia Higher Education Research Policy Analysis, LH Martin Institute for Higher Education Leadership and Management, www.lhmartininstitute.edu.au

³ <http://www.graduatecareers.com.au/research/surveys/beyondgraduationsurvey/>

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survey provides insight into the longer-term value of early investments in career development and can be used by both industry and individuals to determine future career scenarios.

The Forum would welcome efforts to **expand the careers knowledge base** through provision of support to extend this survey out to 10 years from graduation. It is important that we fully understand the value of the financial investment that is being made through education and training within universities but at the present time there are gaps in our knowledge. For example there is a significant attrition of mid-career researchers, particularly women, from the research workforce between the ages of 35-45 (typically 5-10 years post-PhD)⁴.

2. Do you have any comments on the possible direction for the Australian Government?

The Green Paper sets out that the Australian Government's role in developing a National Career Development Strategy will be to provide national leadership, disseminate national career information, and provide services for those at risk in the labour market place.

The Australian Government is in a unique position to give strategic direction to a National Career Development Strategy. The Green Paper focuses on two main roles for the Australian Government: disseminating national career information, and providing services for those at risk. In addition to disseminating national career information, the Australian Government should also play a role in identifying gaps in knowledge and collecting data that will help underpin the career development knowledge base. In particular this could extend to supporting efforts to collect longitudinal careers data as outlined above.

If the Australian Government assumes the role of providing services to 'those at risk in the labour market place', it is important that a broad approach is taken to determine those at risk. Those at risk include highly skilled early and mid-career researchers who are unable to make the best use of their skills due to the few long-term academic research positions available. It is important that there is a return on the education investment made by both Government and individuals, through the full utilisation of skills within the economy. This could involve the Australian Government supporting initiatives that enhance career development opportunities and professional skills training, and increase career mobility for early and mid-career researchers.

Some examples of these initiatives:

- **Doctoral Training Centres** in the UK are university-based hubs which focus on specific areas (e.g. nuclear fission)⁵. DTC courses run for four years rather than the three of a standard UK PhD, and include formal course work as well as lab experience. Together with increased professional skills training, DTCs will ensure their PhD graduates obtain a well-rounded education with transferable skills.
- **Mentoring Programs** across education, industry and government sectors. Encourage work experience in higher education, industry and government early on so that early career researchers establish a strong network and a team of mentors from multiple sectors.
- **Secondment Programs** that enable an early-mid career researcher to gain experience in a complementary area such as government, education, business, industry or interdisciplinary

⁴ Schofield D. (2009) Planning the Health and Medical Research Workforce 2010-2019. Australian Society for Medical Research.

⁵ Cressey D. (2012) PhDs Leave the Ivory Tower. *Nature* **484**, 20. doi:10.1038/484020a

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research. This would develop a researcher's fundamental skill set and their professional network. In 2012, the Promotion of Excellence in Learning and Teaching in Higher Education program in the Office for Learning and Teaching, offered eligible academics secondments in the Department of Industry, Innovation, Science, Research, Teaching and Education for up to 12 months. This program is welcomed by the Forum and could readily be expanded to other areas such as CSIRO, industry or education, and could also include early-mid career researchers from the academic sector. CSIRO currently allows its employees to complete secondments in a variety of Government departments.

- **Fast-Track Courses** and work experience programs to re-train skilled, older Australians.

Significant attrition of experienced and skilled researchers, especially women, occurs at the mid-career phase⁴. These are typically highly qualified postdoctoral researchers aged 35-45 years who seek to transition to a new career for various reasons. Providing opportunities and support for researchers to fast-track into other professions, such as teaching, could strengthen our education sector in the STEM disciplines.

- **Family-friendly and gender equity policies** would facilitate the professional training, career development and retention of women in the STEM fields. Gender imbalance exists in many different professions, but is especially seen in STEM research. The participation of women at the undergraduate and post-graduate levels is quite high, but drops significantly at senior levels. Early and mid career researchers are in the formative years of their personal and professional life – often establishing their careers while having a young family. Encouraging both education and professional organisations to develop effective family-friendly and gender equity policies would provide greater support for these individuals.

3. Do you have any comments on the ongoing and future role for the state and territory governments?

The Australian Government has developed the *Job Guide* (www.jobguide.deewr.gov.au) and *myfuture* (www.myfuture.edu.au) as well as National Career Development Week (www.ncdw.com.au). The *myfuture* website is a joint initiative of Australian, state and territory governments. These are all valuable resources that provide a strong foundation for the development of additional tools and initiatives aimed at helping individuals navigate the critical career junctures during their higher education and beyond, well into their professional careers.

It is important that state and territory governments view workforce career development as a shared responsibility with the Commonwealth. For example, much of Australia's health and medical research, especially translational research, is performed by clinical and laboratory researchers in hospitals, universities and research institutes. Public hospitals are funded by state government, while research institutes and universities are funded primarily with federal funds (e.g. NHMRC grants and fellowships). In addition, agriculture, environment and primary industry have strong internal state and territory government departments that oversee these areas, and these sectors are often also research-active. Career development of emerging scientists in these areas needs to be approached by state, territory and federal governments in a collaborative manner.

4. Do you have any suggestions for enhancing the role for industry?

Increasing the commercialisation skills of Australian researchers and innovative capacity of their research, would facilitate greater links between the business sector and research/academia in the

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future. An example of this is the CSIRO which has strong academic and industry ties, as well as an excellent track record of translation of basic research, science, inventions and discoveries that lead to practical and lucrative financial outcomes.

Diversifying PhD training by including a role for industry and innovation, will broaden the application and value of the PhD in society, and prepare research trained scientists for a variety of scientific roles, enhancing their overall career prospects. There are a number of excellent PhD programs that include a role for industry, such as:

(i) The *Balanced Scientist* program developed by the Invasive Animals Co-operative Research Centre⁶ where PhD students undertake the equivalent of a Diploma in Research Management, which includes **industry placements**, courses in intellectual property and budget management, commercialisation, paper- and grant-writing;

(ii) The Australian Technology Network of Universities⁷ PhD in Mathematics and Statistics which aims to “deliver research solutions to industry and train cohorts of doctoral students with broad capabilities generally not currently acquired during Australian PhD candidature” and;

(iii) A recently developed PhD program at The University of Queensland⁸.

Provision of tax incentives to industry would also encourage investment in career development programs to facilitate training and experience across the public and private sectors.

5. Do you have any comments on the formation or proposed direction for a national leadership body?

The Forum supports the formation of a National Career Development leadership body, which could coordinate initiatives that facilitate greater mobility and transition between sectors by ensuring early and mid-career researchers receive thorough professional training, including fundamental transferable skills. Comprehensive and standardised measures of performance and productivity, which are recognised by all sectors, could also streamline the transition between careers and across sectors. This will increase the opportunities for employment and encourage communication 'across professional borders'. It is critical that this body includes representatives from Government as well as public and private organisations.

6. Do you have any additional comments or suggestions?

It is important that we maximise an individual's potential for success in their chosen career. Australia's research community is small compared to the United States, the United Kingdom, Germany or China⁹. This means that there is less mobility between disciplines and sectors, and fewer employment opportunities.

A National Career Development Strategy could help address these issues by ensuring early and mid-career researchers have access to the resources they need to gain valuable transferable skills. Ongoing career development would increase the propensity for long-term job security and ensure people can develop and maintain a productive career in the area for which they train.

⁶ <http://www.invasiveanimals.com/education/>

⁷ <http://www.atn.edu.au/IDTC/about/background.htm>

⁸ <http://www.uq.edu.au/grad-school/career-advantage-phd/about>

⁹ Cyranoski D, Gilbert N, Ledford H, Nayar A and Yahia M. (2011) The PhD Factory. *Nature* **472**, 276.